Sheet problem on airgap & Tooth mmf

A machine has the following dat

Pole arc = 0.3 m

length of machine = 0.36 m

length of airgap = 0.0080 m

slot pitch at the airgap surface = 0.025 m

slot pitch at the bottom of slot = 0.022 m

depth of slot = 0.06 m

width of slot = 0.012 m

number of ventilating ducts = 5

width of each ventilating duct = 0.01 m

flux per pole = 7.2×10^{-3} Wb

Calculate

(a) the mmf required for air

(b) the mmf required for teeth neglecting the slot flux

(c) the mmf required for teeth considering the slot flux.

Ans (a) 4860 A (b) graphical 1122 A; Simpson 1137; $B_{\frac{1}{3}}$ 1200

(c) using Simpson 937

B	1.95	2.2	2.25	2.4	2.45
H	200	600	800	1600	9000

Sheet on Field coils

1. Design the winding of a 110 V to obtain the greatest number of ampere-turns with dissipation of about 6 K. The gross winding space is 0.26 x 0.22 m. Mean length of turn is 12 m. Assume a space factor of 0.55 and resistivity of copper, when hot, 2×10^{-8} ohm.m.
   Ans: 68,600.

2. Determine the copper diameter of the wire of a coil to give 10,000 AT with 120 V across its terminals and a mean length of turn of 0.75 m. Assume resistivity to be 2×10^{-8} ohm.m.

3. A shunt coil has to develop 9000 AT. The voltage drop in the coil is 40, and the resistivity of the round wire used is 2.1 microchms per Cm cube. The winding depth is 0.035 m approximately and the mean length of turns 1.4m. Design a coil so that the power wasted is 700 per squared meter. ~~The total surface of the coil (i.e inner,~~ Take the diameter of the insulated wire to be 0.4 mm greater than the bare wire.